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PATENT

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Applicant:	Robert C. Beck	Examiner:	(Mendez, M.)
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Title	Catheter		

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I hereby certify that this paper is being deposited in the United States Postal Service, as first class mail, in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231

Signature: 
Printed Name: Robert C Beck

Preliminary Amendment

Assistant Commissioner for Patents
Washington, DC 20231

This application is a continuation (divisional) of parent case 08/862,277 filed 05/23/1997. This preliminary amendment corrects typographical and numbering errors and introduces incorporated material from the provisional application entered into the parent application.

Figures 2 and 3 from the provisional have been relabeled as figures 5 and 6 respectively. Corresponding numbering changes have been made and no new matter has been introduced. New drawing are submitted herewith.

AMENDMENTS

Please amend the specification as follows:

On page 2, line 12, after "remove" insert -- this--.

On page 3, line 2, delete "catcher" and insert thereof
--catheter --.

On page 3, line 25, insert

--Fig. 5 is a schematic diagram of an alternate embodiment of the catheter;

Fig. 6 is a schematic diagram of an alternate embodiment of the catheter. --.

On page 2, line 12, after "remove" insert -- this--.

On page 4, line 13, delete "21" and insert thereof
--2 --.

On page 4, line 17, delete "21" and insert thereof
--2 --.

On page 5, line 6 delete "24" and insert thereof
--42 --.

On page 6, line 5, delete "87".

On page 7, line 10, delete "if" and insert thereof
--If --.

On page 7, line 13, delete "colluded" and insert thereof
--connected --.

On page 7, line 14, insert

-- Turning to Fig5, there is shown a distal 11 end portion of an illustrative first embodiment of the thrombectomy catheter 10. The outer diameter of the thrombectomy catheter 10 is defined in this embodiment by the sheath 24 which also forms and defines one wall of a throat 36 with respect to a flow control body 16. The sheath 24 also defines a central axis 37. The high pressure supply lumen 18 delivers fluid to a slit 40 which discharges fluid in a generally radial direction with respect to the central axis 37. In

operation, the slit 40 will have dimensions defining a slit orifice area smaller than the cross-sectional dimension of the interior of the high pressure supply lumen 18. In the figure the slit 40 directs the jet away from the central axis at ninety degrees but other angles are contemplated within the scope of the disclosure. A slight step 42 may be formed proximate the flow control body 16. The height of the step helps to turn the sheet of fluid 44 which emerges from the slit 40. As the fluid emerges, it entrains fluid on both sides of the jet. Since the amount of fluid which can be entrained on the inner side next to the flow control body 16 is limited, the jet turns and follows the contour of the body 16, thus turning through approximately ninety degrees in the illustrative example into the annular throat 36 formed between the sheath 24 and the body 16. Both lesser and greater degrees of turning are contemplated. Ninety degrees of turning is desirable because it presents more fluid entrainment area to engage and eject thrombus.

This embodiment of the device also shows a guide wire 26 which may be used to position the thrombectomy catheter 10 within a body vessel. For use in coronary applications, it is important that the guide wire be small, and the discharge sheath is shown with an opening 46 which permits the thrombectomy device 10 to be delivered over the guidewire 26. It should also be noted, that the position of the aperture 46 is sufficiently proximal of the distal end of the sheath 24 to permit retraction of the guide wire 26 fully into the discharge lumen 20.

Fig. 6 shows an illustrative alternate second embodiment or design for the thrombectomy catheter 10. In this version of the device the nozzle slit 33 is formed as an annular ring at the periphery of the outer sheath 24. Once again the jet is issued radially at an angle with respect to the central axis 37. In this version secondary jets 41 may be formed between the supply lumen and the discharge lumen to assist in removal of debris. In this version the high pressure supply lumen 18 delivers fluid to the plenum